

Serial No.: 10/821,521

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A low-profile ~~An acoustic~~ transducer comprising:

a frame comprising a ferromagnetic material and providing a closed return path for a magnetic field generated by a magnet structure;

a diaphragm having a substantially planar projection surface, where the diaphragm is operatively attached to the frame;

the a magnet structure mounted on the frame, where the magnet structure produces a magnetic-field region; and

an electrically conductive voice coil coupled to the diaphragm and extending out of a plane of the projection surface;

where the voice coil resides at least partially in the magnetic-field region.

2. (Previously Presented) The low-profile transducer of claim 1, where the magnet structure includes a pole surface, and where a distance between the pole surface and the voice coil is substantially constant during excursions of the voice coil.

Serial No.: 10/821,521

3. (Previously Presented) The low-profile transducer of claim 1, where the magnetic-field region is substantially uniform throughout an excursion region of the voice coil.

4. (Previously Presented) The low-profile transducer of claim 1, where the voice coil has a substantially flat structure in the magnetic-field region, and where a plane of the voice coil in the magnetic-field region is substantially perpendicular to a magnetic field in the magnetic-field region.

5. (Previously Presented) The low-profile transducer of claim 1, further comprising:

a fin having a first edge and an opposing second edge;

where the first edge of the fin is attached to the projection surface;

where the fin extends in a direction away from the projection surface and into the magnetic-field region; and

where the voice coil is mounted on the fin.

6. (Previously Presented) The low-profile transducer of claim 5, where the fin extends in a direction substantially perpendicular to the projection surface.

Serial No.: 10/821,521

7-8. (Canceled)

9. (Previously Presented) The low-profile transducer of claim 1, where the magnet structure comprises a magnet and a portion of the frame.

10. (Previously Presented) The low-profile transducer of claim 1,

where the frame comprises a ferromagnetic material,

where the magnet structure comprises a magnet and a portion of the frame, and

where the magnetic-field region is formed between the magnet and the portion of the frame.

11. (Canceled)

12. (Currently Amended) The low-profile transducer of claim 1, where ~~the frame is non-ferromagnetic and where~~ the magnet structure comprises a magnet and a ferromagnetic material.

Serial No.: 10/821,521

13. (Previously Presented) The low-profile transducer of claim 1, where the frame has a substantially crenellated shape.

14. (Previously Presented) The low-profile transducer of claim 1, where the frame includes a groove.

15. (Previously Presented) The low-profile transducer of claim 1, where the projection surface of the diaphragm is in the shape of a rectangle.

16. (Previously Presented) The low-profile transducer of claim 1, comprising at least three voice coils and further comprising three fins, where one of the voice coils is mounted on each of the fins.

17. (Previously Presented) The low-profile transducer of claim 1, further comprising side surfaces at two or more perimeter edges of the projection surface, where the side surfaces extend out of a plane of the projection surface.

18. (Previously Presented) The low-profile transducer of claim 17, where the voice coil is mounted on a side surface.

Serial No.: 10/821,521

19. (Previously Presented) The low-profile transducer of claim 17, further comprising at least one fin mounted between the two perimeter edges of the projection surface.

20. (Previously Presented) The low-profile transducer of claim 1, where the projection surface and the fin are formed from a single sheet of material.

21. (Previously Presented) The low-profile transducer of claim 20, where a 90° fold in the sheet of material is adjacent to a 180° fold in the sheet of material.

22. (Previously Presented) The low-profile transducer of claim 20, where two 90° folds in the sheet of material are adjacent to a 180° fold in the sheet of material.

23. (Previously Presented) The low-profile transducer of claim 20, where a first 90° fold in the sheet of material is adjacent to a second 90° fold and the second 90° fold is adjacent to a 180° fold in the sheet of material.

Serial No.: 10/821,521

24. (Previously Presented) The low-profile transducer of claim 1, further comprising a filler material attached to the projection surface, and a second sheet of material attached to the filler material, where the filler material and the second sheet provide additional rigidity to the projection surface.

25. (Previously Presented) The low-profile transducer of claim 1, further comprising a second sheet of material attached to the projection surface.

26. (Previously Presented) The low-profile transducer of claim 1, where the projection surface of the diaphragm is operatively attached to the frame.

27. (Previously Presented) The low-profile transducer of claim 26, where the attachment is provided by a pliable surround.

28. (Previously Presented) The low-profile transducer of claim 1, further comprising a side surface connected at an angle to the projection surface, where the side surface is operatively attached to the frame.

Serial No.: 10/821,521

29. (Previously Presented) The low-profile transducer of claim 28, where the attachment is provided by a pliable surround.

30. (Previously Presented) The low-profile transducer of claim 1, where the magnet structure comprises at least two stationary magnets having two magnetic-field regions.

31. (Currently Amended) The low-profile transducer of claim 1, where the magnet structure comprises [[an]] a permanent magnet and a ferromagnetic yoke structure.

32. (Previously Presented) The low-profile transducer of claim 1, where the magnet structure comprises a permanent magnet.

33. (Previously Presented) The low-profile transducer of claim 1, where the magnet structure comprises an electromagnet.

34. (Previously Presented) The low-profile transducer of claim 1, where the magnet structure comprises a material selected from the group

Serial No.: 10/821,521

consisting of ferrite, neodymium, strontium, samarium cobalt, mixtures of Al, Ni, and Co, and combinations thereof.

35. (Previously Presented) The low-profile transducer of claim 1, where the frame has a substantially crenellated shape, and where the magnet structure includes a magnet attached to a portion of the crenellated frame.

36. (Previously Presented) The low-profile transducer of claim 35, where the magnet is attached to the frame and oriented so that adjacent to a pole of the magnet, a magnetic field of the magnet is oriented substantially parallel to the projection surface.

37. (Previously Presented) The low-profile transducer of claim 35, where the magnet is in contact with the bottom of the frame.

38. (Previously Presented) The low-profile transducer of claim 35, where the frame comprises a groove, and where the magnet is adjacent to the groove.

39. (Canceled)

Serial No.: 10/821,521

40. (Previously Presented) The low-profile transducer of claim 1, where the voice coil comprises a metal selected from the group consisting of silver, gold, aluminum, copper, and mixtures thereof.

41. (Previously Presented) The low-profile transducer of claim 1, where the voice coil comprises a substantially flat ribbon of metal.

42. (Currently Amended) The low-profile transducer of claim 1, where a conductive metal is formed on a [[the]] fin of the diaphragm to form the voice coil.

43. (Previously Presented) The low-profile transducer of claim 1, where the voice coil comprises an insulated metal wire.

44-65. (Canceled)

Serial No.: 10/821,521

66. (Previously Presented) A method of reproducing a sound wave comprising:

supplying an electric potential of changing polarity to a voice coil residing in a magnetic-field region,

where the voice coil is operatively attached to a non-electrically conductive diaphragm having a substantially planar projection surface and at least one fin, and

where the fin is substantially perpendicular to the projection surface.

67. (Previously Presented) The method of claim 66, where the diaphragm is attached to a frame by a pliable surround.

68. (Canceled)

Serial No.: 10/821,521

69. (New) A low-profile transducer comprising:
a frame comprising a non-ferromagnetic material;
a diaphragm having a substantially planar projection surface, where the diaphragm is operatively attached to the frame;
a magnet structure mounted on the frame, where the magnet structure produces a magnetic-field region and the magnet structure comprises a permanent magnet and a ferromagnetic U-shaped yoke structure; and
an electrically conductive voice coil coupled to the diaphragm and extending out of a plane of the projection surface;
where the voice coil resides at least partially in the magnetic-field region.

70. (New) The low-profile transducer of claim 69, where the permanent magnet mounts close to an end of an arm of the U-shape.

71. (New) The low-profile transducer of claim 69, where the diaphragm includes a skirt extending away from the planar projection surface.